



CITY of BEAVERTON

2001 Water Quality Report

Your Water Quality Is Our First Priority

The City of Beaverton is pleased to provide you with this 2001 Water Quality Report. The purpose of the report is to:

1. provide you with information about your drinking water, and
2. to comply with U.S. Environmental Protection Agency (EPA) reporting requirements.

Using data collected during 2001, we have summarized information about your water supply sources, water facilities that deliver water to your tap, and the quality of your drinking water. We are also taking this opportunity to present additional information about other programs underway that are helping to ensure you have safe and dependable drinking water.

The City of Beaverton is proud of its quality water supply, which meets or exceeds all federal and state water quality requirements. If you have any questions regarding your water quality or about information presented in this report, please call us at 503-350-4017.

Si Habla Espanol: Este informe contiene informacion muy importante. Traduscalo o hable con un amigo quien lo entienda bien.

www.ci.beaverton.or.us



Your Water System at a Glance

The City of Beaverton supplies water to about 73 percent of the 77,170 residents who live within City limits. The remaining 27 percent, or approximately 21,000 Beaverton residents, are supplied water by the Tualatin Valley Water District, West Slope Water District, and Raleigh Water District.

The City is a member of the Joint Water Commission (JWC), an intergovernmental group whose members include Beaverton, Hillsboro, Forest Grove, and the Tualatin Valley Water District. The JWC was formed to store, manage and treat water for its customers. As a resident of Beaverton, your water is supplied primarily by the JWC. The sources of

WHAT'S AN ACRE-FOOT?

1 acre-foot (ac-ft) = 325,850 gallons =
1 foot of standing water on an acre of land.

JWC water are the Tualatin and Trask River watersheds located in the Coast Range. The City has a 25% ownership right in the facilities operated by the JWC.

In the winter and spring when ample stream flow is available, the City uses its water rights to obtain water from the Tualatin River. Raw water (before treatment) is pumped from the nearby Tualatin River to the JWC treatment plant (located south of Forest Grove). The treatment plant treats and

filters the water so it meets federal drinking water standards.

The City also owns the right to store raw water (run-off from the Coast Range) in Henry Hagg Lake (Scoggins Reservoir) and Barney Reservoir, both located in the Coast Range. During the summer when water demand is high and the Tualatin River is low, water stored in Henry Hagg Lake and Barney Reservoir is released into the Tualatin River for eventual withdrawal and treatment for drinking water. Henry Hagg Lake and Barney Reservoir supply most of Beaverton's raw water during the summer. This process maintains minimum stream flows in the Tualatin river, which is critical to sustaining a healthy river eco-system. Water released from Barney Reservoir is diverted through a short pipeline across a narrow Coast Range divide into the headwaters of the Tualatin River. Water released from Henry Hagg Lake travels by way of Scoggins Creek to the Tualatin River. Downstream, water is then withdrawn from the Tualatin River and pumped to the JWC water treatment plant (see figure below). The City also is participating in evaluating the potential water storage expansion of the Henry Hagg Lake along with other west-side cities. To meet future demands preliminary studies are underway to evaluate increasing the storage capacity of the Hagg Lake reservoir by 16.5 billion gallons (50,600 acre-feet [ac-ft]) by raising the Scoggins Dam by up to 40 feet.

From left to right: Barney Reservoir, Henry Hagg Lake, Joint Water Commission's Water Treatment Facility, City of Beaverton 5MG and 1.75 water storage tanks



Water released from Barney Reservoir is diverted through a short pipeline across the Coast Range divide into the headwaters of the Tualatin River.

Water released from Henry Hagg Lake travels by way of Scoggins Creek to the Tualatin River

Water is then withdrawn from the Tualatin River and pumped to the JWC water treatment plant.

Treated water is pumped about one-half mile to Fernhill Reservoir, a 20-million gallon storage reservoir.

From Fernhill Reservoir, water travels approximately 19 miles by gravity through a large-diameter transmission line into the City water distribution systems.



The JWC water treatment plant has a peak capacity of 70 million gallons of finished drinking water per day. Drinking water produced by the JWC water treatment plant is pumped about one-half mile to Fern Hill Reservoir, a 20-million-gallon above ground storage reservoir. From Fern Hill Reservoir, water travels approximately 19 miles by gravity through a large-diameter transmission line to Beaverton and the City's two terminal storage reservoirs. The terminal storage reservoirs in Beaverton hold a total of 20 million gallons and are owned and operated by the City. Water reaches Beaverton water customers through a distribution network of pipes and valves. The City maintains five in-town water storage reservoirs for a total of 28.25 million gallons.

Water Storage — Do We Have Enough?

The City of Beaverton owns the right to store raw water (water before it's treated) in Barney Reservoir and Scoggins Reservoir (Henry Hagg Lake). In 1999, we participated in the expansion of the Barney Reservoir by purchasing a 21.5 percent ownership, and by acquiring 4,300 ac-ft of raw water. We also own 4,000 ac-ft in Henry Hagg Lake. Beaverton's share in these two impoundments totals 8,300 ac-ft (about 2.7 billion gallons) of stored raw water. This water is needed during the summer months when we cannot draw on our winter (non-peak season) water rights from the Tualatin River. The City's winter water rights on the Tualatin River is 16.2 million gallons per day (mgd). To give you some perspective, our average daily water consumption for 2001 was 8.64 mgd, with a high of 14.1 mgd. The City is currently pursuing other alternatives to help meet increased water demand, such as water conservation, Aquifer Storage and Recovery (ASR), and storage expansion options like raising Scoggins Dam, and purchasing a share of the proposed Bull Run Regional Drinking Water Agency.

Last Year's Drought — How Did the City Manage?

Last year was one of the driest on record in the State of Oregon. The JWC partners were left with the lowest water levels behind the water supply dams since 1977. However, the City was able to supply ample water to its customers throughout last summer's drought. This was accomplished because: the City has existing storage rights in Scoggins and Barney reservoirs that they can use when they cannot draw water from the Tualatin River; the City also bought water from other wholesale suppliers (Portland and Tualatin Valley Water District); the City used

potable water banked in their aquifer storage and recovery wells; and citizens of Beaverton conserved water on a voluntary basis. Each of these elements when combined enabled the City to supply a sufficient quantity of water to its residents during a period when raw water was limited. A more detailed discussion of the last three elements is provided below.



HENRY HAGG LAKE, DROUGHT OF 2001



BARNEY RESERVOIR, DROUGHT OF 2001

SAFE DRINKING WATER HOTLINE

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the Environmental Protection Agency's Safe Drinking Water Hotline **(800-426-4791)**.

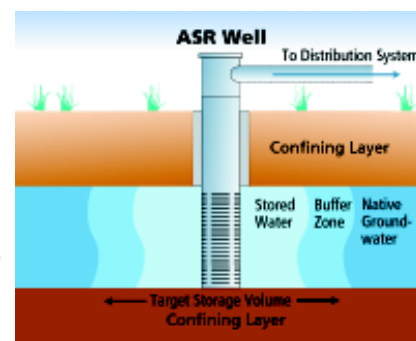
Relationship with Other Cities

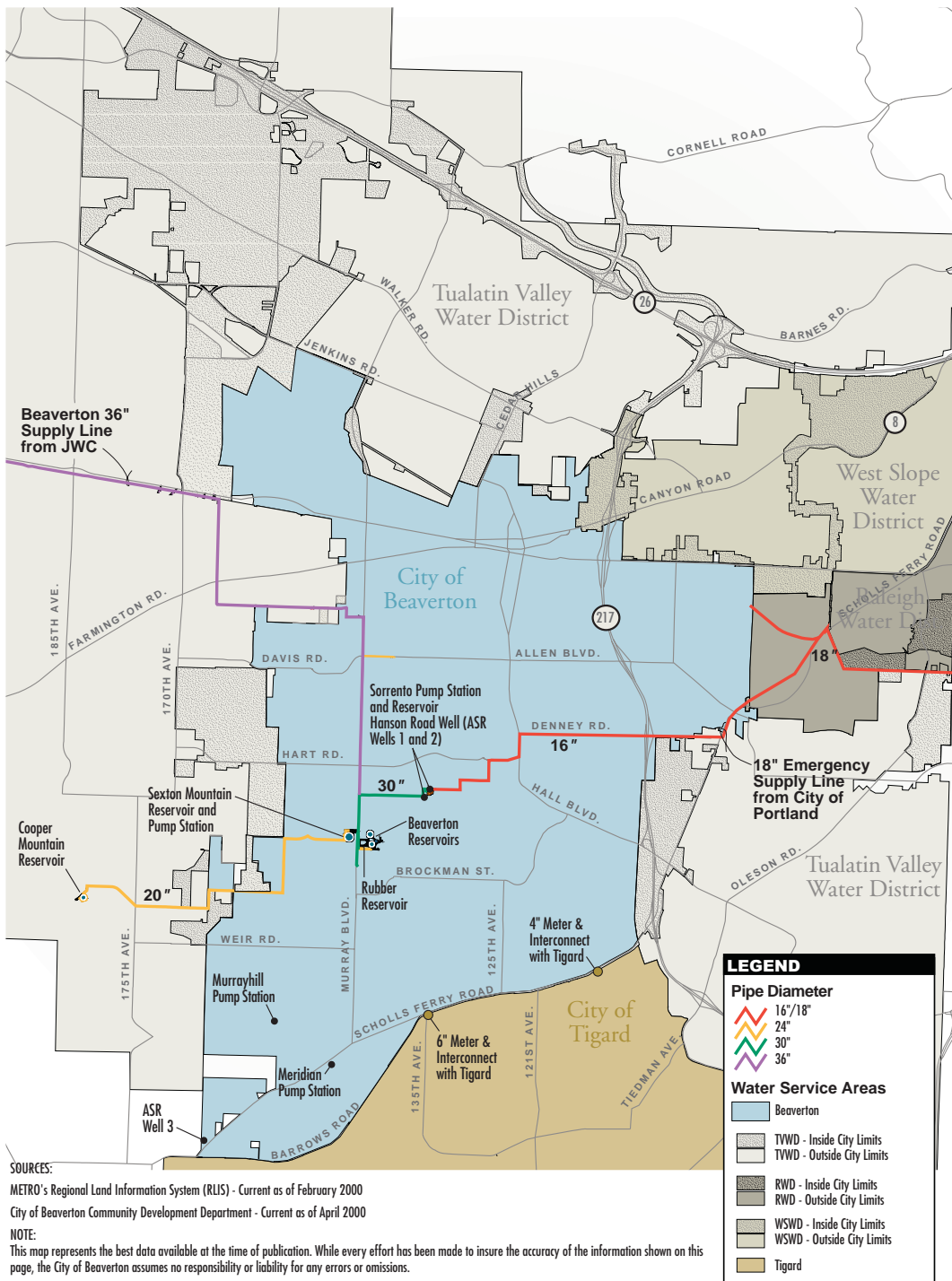
The City of Beaverton has relationships with the Tualatin Valley Water District and the City of Portland. These public water providers can supply water to the City through interties, if needed. For the Tualatin Valley Water District, the City has interties at 153rd/Jenkins and Center Street/122nd Avenue. For the City of Portland, the City has an intertie at Vermont Street/60th Avenue. The Tualatin Valley Water District water consists of a blend of JWC and Portland water, whereas the Portland water supplied through the Vermont Street intertie consists solely of Bull Run water. During the year 2001, the City of Beaverton purchased 215 million gallons from Tualatin Valley Water District and 5.6 million gallons from the City of Portland.

These relationships are very important and ensure that the City of Beaverton will be able to supply water to its customers when river stage levels in the Tualatin River limit withdrawal under the City's existing rights. In total, the City purchased about 220.6 million gallons during the summer of 2001 from the Tualatin Valley Water District and Portland to meet peak demands. The City also purchased 228 million gallons of raw water from the City of Forest Grove (a JWC partner) to preserve a portion of the City's allocated storage volume in the Barney Reservoir.

Aquifer Storage and Recovery (ASR), Project Update

Perhaps you remember from last year's Water Quality report that the City of Beaverton has been developing ASR at the Sorrento Water Works site, located at SW 136th Avenue and Hanson Road in Beaverton. The City has two ASR wells located at the site, referred to as ASR No. 1 (retrofit of the old Hanson Road well) and ASR No. 2, a new well drilled in 2000 and brought on-line in 2001.





ASR is defined as the storage of water in a water-bearing zone, or aquifer, and the recovery of that water out of a well when the water is needed. Typically, water is stored in aquifers during the winter, when supply is plentiful. During the summer, when demand runs high, the water is recovered. This system is beneficial in a number of ways. For example, it can help us to meet future water demands and postpone or limit the need to purchase water from other sources. And, we may also be able to postpone building new aboveground storage reservoirs, which are more expensive than ASR.

The aquifer at the Sorrento Water Works site consists of horizontal fractured rock and rubble zones located between individual basalt flows. Drinking water supplied by the JWC treatment plant is injected into the horizontal zones for storage. On recovery, the water looks and tastes aesthetically pleasing. In contrast, native groundwater contains minerals that create a harder taste. Native groundwater is normally blended with softer JWC-treated water.

Despite the supply challenges during the summer of 2001, the City was able to markedly reduce the amount of additional water that would have been purchased because of the availability of ASR. A total of 250 million gallons of water were pumped from the wells located at the Sorrento site —150 million gallons constituted stored JWC water and the remaining 100 million gallons consisting of native groundwater. However, the native groundwater was much improved because of ASR activities. Overall the ASR contribution to the entire Beaverton City water supply for the calendar year 2001 was nearly 8 percent.

ASR #2 under construction, piping, after initial landscaping



The City also has completed a test well (called ASR No. 3) located near SW Loon Drive and Scholls Ferry Road. This well will be developed as a 0.5 million gallon per day ASR well in the future. The City has also evaluated the option of installing another ASR well (ASR No. 4) at the Sorrento site in the area where a new proposed subdivision is planned. Preliminary test data indicate that the Sorrento site subsurface conditions can support three wells injecting at a combined rate of around 4.5 million gallons per day with a potential recovery rate of over 5.0 million gallons per day. Prior to construction, the City will complete a land use process to obtain all required land use development permits.

Voluntary Water Conservation

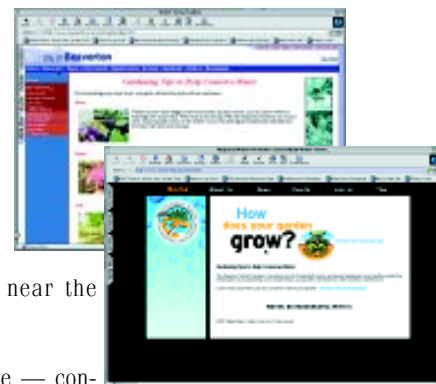
Last summer's water shortage brought home the need to use water wisely. Local citizens pitched in last summer and reduced the average daily demand on a voluntary basis by about 10%, which is excellent. Water conservation is an important component to any City's water management plan. Did you know that 97% of the world's water is salty or otherwise undrinkable and another 2% is locked up in ice caps and glaciers. That leaves just 1% for all of humanity's needs — for agriculture, manufacturing, communities and personal households. No wonder water is such a precious commodity! Conservation tips can be found on the City's web page and includes such suggestions as: when to water your yard; how to save water in and around your garden; suggestions on when to water; planting tips to save water; and much more. Please check it out at <http://www.ci.beaverton.or.us>.

What Else Has The City Been Doing?

Numerous utility and infrastructure projects are underway in Beaverton. With 220 miles of waterlines, 234 miles of sanitary sewers, and 204 miles of underground storm drainage pipes, the City maintains an active annual replacement program of underground utilities. A summary of some of the projects completed and/or underway is provided below:

- South Central Beaverton Utilities Improvements Phase 3 — replacement and upsizing of water, storm and sanitary lines.
- Water main replacement and upgrade on Allen Boulevard from King Boulevard to Lombard Avenue — replacement of potable water pipes.
- Hart Road Waterline — waterline replacement and upsizing project along Hart Road.

- ASR No. 2 Activation — see aquifer storage and recovery write-up.
- Sorrento Reservoir No. 2 reactivation and Sorrento Water Works yard piping — upgrading the reservoir and associated piping.
- Well drilling of ASR No. 3 — see aquifer storage and recovery write-up.
- Installation of a monitoring well near the proposed ASR No. 4 location near the Sorrento Water Works site.
- Murrayhill Pumping Station Upgrade — construction of a new pump house and installation of a new pump station for drinking water supply to higher elevations of southwest Beaverton.
- Installation of two groundwater monitoring wells near the former Cobb Quarry to act as an early warning system for any possible groundwater contamination that could eventually impact the City's ASR wells (note: no abnormal chemicals have been detected to date in samples obtained from the wells).
- Water supply feasibility evaluation for the Integrated Water Resource Management Plan for the Tualatin River, which includes an assessment of the Scoggins Dam raise to increase water storage.



<http://www.ci.beaverton.or.us>

<http://www.conserveh2o.org>

Last year the City of Beaverton delivered 3.15 billion gallons of high quality drinking water to its customers.



A pipe replacement project required tunnelling under the railroad crossing on Hall Boulevard.



Repair of 5MG tank, hydrant replacement project, Beaverton's new fountain, Murray Hill pump station

2001 Water Quality Monitoring Results

The US EPA requires all water utilities to monitor for all regulated compounds. The table on page 7 summarizes the detected compounds in the City of Beaverton water supply. All of the detections fell below the maximum contaminant level set by the federal and state agencies. Not listed in the table are 67 compounds that were not detected. The water supplied to the City of Beaverton is tested at the wells, at the post-treatment process, in the distribution system, and at the tap. We have also included unregulated compounds in the table. The City of Beaverton is proud of its water supply, which meets or exceeds all federal and state water quality requirements.

- In 2000 the City of Tigard received permission to purchase JWC water. To provide JWC water through the City of Beaverton's water lines, the two cities are installing new interties so as to provide Tigard with up to an additional 4 million gallons per day. Construction work for this project will begin in 2002.

The Proposed Bull Run Regional Drinking Water Agency and Other Future Water Supply Options

In April 2001, the Portland City Council directed Commissioner Eric Sten and Portland Water Bureau staff to

form a regional water supply agency. The City of Beaverton has elected to participate along with other water utilities in the Phase 2 evaluation of the Proposed Regional Drinking Water Agency option.

In parallel with the proposed Bull Run Agency, the City of Beaverton has also been participating in the localized Tualatin Basin Water Supply Feasibility Study. The most prominent option under the study includes a proposal to raise the Scoggins Dam height and water level (Hagg Lake) by as much as 40 feet, which would provide an additional 50,600 to 104,000 ac-ft of storage capacity. The City's participation in the dam raise would result in 4,000 ac-ft (1.3 billion gallons) of additional supply to the City. The 4,000 ac-ft matches the City's projected increase in water demand over the next 20 years.

The City's participation in both the Proposed Bull Run Agency option and the local Tualatin Basin Study Option are being coordinated by City staff. Our goal is to ensure that Beaverton water customers have an ample supply of high quality water for the future.



LOUIE SIERRAS PHOTO

IMPORTANT HEALTH INFORMATION

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised people such as people with cancer undergoing chemotherapy, people who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, the elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline (800-426-4791).

Drake, Mayor, has participated as one of the 14 drinking water entities to craft a set of key criteria essential to

...If you have questions...

If you have any questions regarding water quality or about information presented in this report, please call us at **503-350-4017**.

The following terms are used to summarize the sampling detects:

Maximum contaminant level (MCL): The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.

Maximum contaminant level goal (MCLG): The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

Maximum residual disinfection level (MRDL): The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

Maximum residual disinfection level goal (MRDLG): The level of a drinking water disinfectant below which there is not known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contamination.

Treatment Technique (TT): A required process intended to reduce the level of a contaminant in drinking water.

Action Level (AL): The concentration of a contaminant which, if exceeded, triggers a treatment or other requirement for a water system to follow.

The following units appear throughout the table:

ND: Not detected

N/A: Not applicable

NTU: Nephelometric Turbidity Units

ppm: parts per million, or milligrams per liter (mg/L)

ppb: parts per billion, or micrograms per liter (µg/L)

pCi/l: picocuries per liter, a standard measurement of beta particles in water

Lead: Infants and young children are typically more vulnerable to lead in drinking water than the general population. It is possible that lead levels at your home may be higher than at other homes in the community as a result of materials used in your home's plumbing. If you are concerned about elevated lead levels in your home's water, flush your tap for 30 seconds to 2 minutes before using tap water. If you wish to have your water tested or would like additional information, call the Safe Drinking Water Hotline (800-426-4791).

Radon: Radon is a radioactive gas that you can't see, taste, or smell. It is found throughout the U.S. Radon can get into indoor air when released from tap water from showering, washing dishes, and other household activities. Compared to radon entering the home through soil, radon entering the home through tap water will in most cases be a small source of radon in indoor air. The EPA is in the process of reviewing a new radon rule for drinking water but has not finalized the rule. EPA is considering a drinking water standard for radon that could range from 300 to 4000 picocuries per liter (pCi/L).

Radon is a known human carcinogen. Breathing air containing radon can lead to lung cancer. Drinking water containing radon may also cause increased risk of stomach cancer. The radon found in the native groundwater pumped from the Sorrento site does contain radon; however, this water is normally blended with JWC water, which results in lower radon levels at the taps.

For additional information, call the Oregon Health Division or EPA's Radon Hotline (800-SOS-RADON).

Additional Water Quality Information

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity.

Contaminants that may be present in the water include:

- Microbial contaminants, such as cryptosporidium, viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
- Inorganic contaminants, such as salts and metals, which can be naturally occurring or result from urban storm runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.

Primary Supply Year 2001¹

Major Water Sources: JWC Treatment Plant, Hanson Road Facility Well Water (Recovered ASR Water and Native Ground-water) and Tualatin Valley Water District (TVWD) (blend of JWC and Bull Run)

Regulated Contaminants	Lowest Concentration	Highest Detection Used for Compliance	Highest Level Allowed (MCL)	Ideal Goals (MCLG)	Major Sources in Drinking Water
Microbiological					
Total Coliform Bacteria	ND	0.8 percent of samples in February	Must not detect coliform bacteria in more than 5 percent of monthly samples	0	Naturally present in the environment
Turbidity	0.03 NTU	0.4 NTU	As of January 1, 2002, turbidity may never exceed 1 NTU, and must not exceed 0.3 NTU in 95% of daily samples in any month.	N/A	Soil runoff
Inorganics					
Barium	ND	12 ppb	2000 ppb	2000 ppb	Discharge from metal refineries; erosion of natural deposits; discharge of certain drilling wastes.
Nitrate (as Nitrogen)	ND	1.0 ppm	10 ppm	10 ppm	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits
Sodium ²	1.1 ppm	14 ppm	No standard	No standard	Added to water during treatment and erosion of natural deposits.
Fluoride	ND	1.6 ppm	4 ppm	4 ppm	Erosion of natural deposits; discharge from fertilizer and aluminum plants
Copper ⁵	90th Percentile = 0.2 ppm	0.37 ppm	AL = 1.3 ppm	1.3 ppm	Erosion of natural deposits; corrosion of household plumbing systems; leaching from wood preservatives
Lead ⁵	90th Percentile = 3 ppb	23 ppb (Less than 10 percent of samples exceeded the Action Level)	AL = 15 ppb	0 ppb	Corrosion of household plumbing systems; erosion of natural deposits
Radionuclides					
Radon ^{6,7}	Not Detected	720 pCi/l	No standard	No standard	Erosion of natural deposits
Gross Alpha	Not Detected	1.712 pCi/l	15	0	Erosion of natural deposits
Gross Beta	Not Detected	12.2 pCi/l	50 ²	0	Decay of natural and man-made deposits
Disinfection Byproducts and Disinfectant Residuals					
	Range	Average		Byproduct of drinking	water chlorination
TTHMs (Total trihalomethanes) ³ Annual rolling average					
All sites	15.6 - 86.8 ppb	41 ppb	80 ppb	0	
HAAs (total haloacetic acids) ⁴ Annual rolling average				NA	Byproduct of drinking water chlorination
All sites	0 - 96 ppb	33.7 ppb	60 ppb		
Chloramines ²	0.5 - 1.7 ppm	1.70 ppm	4 ppm (MRDL)	4 ppm (MRDL)	Water additive used to control microbes
Chlorine ²	ND - 1.0 ppm	1.0 ppm	4 ppm (MRDL)	4 ppm (MRDL)	Water additive used to control microbes

¹ Data provided by the Joint Water Commission, City of Beaverton and Tualatin Valley Water District.
² EPA considers 50 pCi/l to be the level of concern for beta particles.
³ Total trihalomethanes are disinfection byproducts from the breakdown of chlorine compounds added by the City for disinfection. MCL effective in 2001
⁴ Haloacetic Acids are disinfection byproducts from the breakdown of chlorine compounds added for disinfection.
⁵ Lead and copper data from 2001 sampling of 39 locations across the City of Beaverton.
⁶ Radon detected in water recovered from City well (ASR No. 1)
⁷ Unregulated contaminant

- Pesticides and herbicides, which may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses.
 - Organic chemical contaminants, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, and septic systems.
 - Radioactive contaminants, which can be naturally occurring or result from oil and gas production and mining activities.
- In order to ensure that tap water is safe to drink, EPA prescribes regulations which limit the amount of certain contaminants in water provided by public water systems. Food and Drug Administration (FDA) regulations establish limits for contaminants in bottled water to provide the same protection for public health.



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